

WHAT IS CLAIMED IS:

1. A process for kinetically separating a light hydrocarbon mixture comprising at least two components by preferentially adsorbing a first
5 component on a zeolite adsorbent comprising 8-member rings of tetrahedra as the pore opening controlling hydrocarbon diffusion and alkali metal cations balancing a framework charge, wherein a second component is not preferentially adsorbed, the process comprising the steps of:
 - (a) contacting the light hydrocarbon mixture with the zeolite
10 adsorbent having a $\text{SiO}_2/\text{Al}_2\text{O}_3$ ratio greater than about 50 and less than 200 and having a diffusion rate at least 50 times greater for the first component as compared to the second component; and
 - (b) recovering at least one of the first component and the second component.
- 15 2. The process of claim 1 wherein the zeolite adsorbent is of a CHA structure type.
3. The process of claim 2 wherein the zeolite adsorbent is SSZ-13.
- 20 4. The process of claim 1 further comprising the step of dealuminating the zeolite adsorbent, the dealuminating step occurring before the contacting step.
- 25 5. The process of claim 4 wherein the dealuminating step comprises steaming the zeolite adsorbent.

6. The process of claim 5 wherein the steaming step is performed at a temperature between about 923 K and about 1123 K and a water pressure between about 5 kPa and about 202 kPa.

5 7. The process of claim 1 wherein the alkali metal cations are introduced by ion exchange at a pH greater than about 7.5.

8. The process of claim 1 wherein the cations are selected from the group consisting of sodium, potassium and cesium.

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9. The process of claim 1 wherein the first component comprises propylene and the second component comprises propane.